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ECONOMIC AND INDUSTRIAL AFFAIRS

No. 2179



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USEFULNESS OF PRIVATE PLOT IN AGRICULTURE EMPHASIZED

Sofia IKONOMICHESKI ZHIVOT in Bulgarian 29 Jul 81 p 7

[Text] There is still some vagueness about a perfectly clear problem. The problem concerns the development of private plots by people occupied in agroindustrial complexes and in other areas of public activity. There is vagueness in the practical application of party and governmental decisions, as well as in the theoretical concepts of some individuals, who sometimes occupy responsible posts in the system of social management.

Two concrete cases support my thoughts.

The first one is related to the 2, or even 3 years' groping of an administration, whose employees wanted permission to cultivate several hundred square meters of uncultivated land each. Officials of the okrug and obshtina level created all kinds of obstacles in order to thwart the intention of the employees under the pretext that the land was used as pasture or under the specious pretext that the "hungry field" was not worth the attention, because if it had been good, the cooperative farm would never have abandoned it in the first place...These acts and explanations reveal an inactivity prompted by a sectarian attitude towards an important additional resource for the national economy.

The second case is even more significant. Some people, in connection with a story about excesses in the private plot system published in a central paper, contend that this form of management is a "restoration of old habits." Nobody argues that to have 300 sheep in one's private yard is incompatible with the rule of socialist relations of production. However, it is unjustified to generalize from one distortion and to thwart the whole intention of the policy for the development of the private plot and the subsidiary farm.

Private plots have been neglected for a long time in our country. There were even some paradoxes. In one Thracian village for example, the beds of radishes and lettuces, which were grown in the private gardens, were plowed up and uprooted with tractors. In other places the industrious owners were fined and publicly accused for taking care of their private plots.

The nihilistic attitude towards this management form is rooted in public farming itself, because of its ability to achieve greater efficiency. The higher productivity created justified optimism and led us to view collective farming with

extreme attention. And this was justified, because the expanded farming provided excellent examples and showed that the concentration of production creates extremely good results in labor productivity by lowering the cost of production, and by utilizing to the full the fixed capital and the land.

The development of large-scale cooperative agriculture was accompanied by "waste products," so to speak. We have in mind the attempt to get rid of everything that hampers the large-scale activity, of everything that does not lend itself to cultivation in the enlarged agricultural system.

With the enlargement of our agricultural system, some lands were left out, either because they were not sufficiently fertile, or because they were inconvenient for machine cultivation.

The practical result of this was that by leaving out land from some cooperative and agroindustrial complexes, the already exiguous fund of tillable land was decreased even further. The effectiveness which was achieved was at the level of the individual economic units. At the same time, however, conditions for the decrease of the national economy as a whole were created. This phenomenon created a trend which made the land shortages more acute, and many agricultural leaders justifiably sounded alarm.

Another negative effect of the expansion is that some crops which do not lend themselves to mass cultivation were abandoned. There was a "hunger" for some small vegetables like okra, savory, parsley, and celery.

The large farm created a tendency and preference for crops requiring less labor. And that is precisely why agricultural products which required more labor disappeared from the market despite the great demand. The abundance of cheap, mass-produced crops, which have a decisive importance for the development of agriculture and the economy as a whole, cannot fill up the little vacuums."

The picture will be incomplete if we do not point out that a part of the population is not involved actively in productive labor, despite the existence of good conditions for this. There are many retired people, students, housewives, people occupied in the industry and administration who feel a need for manual labor in their free time. This problem is related not only to people's health, but also to education, because not using this untapped resource of work time undermines society's efforts to create labor discipline in the young generation and to increase the urge and desire for productive labor. Condemnation to inactivity creates consumer attitudes. It encourages people to waste their free time in senseless activities and empty pleasures.

Should we be slaves to the sectarian concept that in socialism large-scale agriculture is incompatible with private plots, that they are mutually exclusive? This question is especially valid now, with the party emphasizing the problem of intensification of material production as well as the nonmaterial sphere and paying special attention to seeking new untapped resources. Should we regard as absolute the concept that it is possible to solve the supply problems if we rely solely on cooperative agriculture?

In a number of countries in the socialist community the private plot has found its appropriate place. In Hungary, for example, it provides 40 percent of the vegetables (especially early ones), 50 percent of the pork production, the major part of raspberry production, production of rabbits, cherries, sour cherries, goose liver, etc. This does not diminish the importance and power of cooperative and state farming, which provides 99 percent of the grain and huge amounts of important key products.

The private plot is given great importance in the USSR. The 26th CPSU Congress paid attention to its further development. Our party, in its search for untapped resources and better supply of the population, correctly directed the attention of the people to the private plot as an additional source for a broader and more varied assortment of foods and for a fuller satisfaction of consumer needs. There is a two-fold benefit: on the one hand the private plot will bring additional quantities of agricultural products to the market, and on the other hand, by satisfying the needs of the producers themselves, it will lower the quantity of consumer goods bought by government and cooperative stores. Here we have not taken into consideration the beneficial effect which this system will have on the health of those people who move less and less and lead a sedentary life.

And what about the danger of "restoration of old habits?" The question is theoretically solved. Marxist-Leninist economic science states that the old relations of production can be restored only if hiring of somebody else's labor is involved. But where is the exploitation in this case? Where is the potential danger that the private plot will create daily and even hourly capitalism, when the social conditions will counter even the smallest symptoms of such development?

Our people say that he who is afraid that the birds will eat the seeds should not sow millet. Should we refrain from sowing millet just because we fear restoration of old relations of production, even if there are no real conditions for that?

Quite real, however, is the danger that unconscientious citizens will neglect their duties to the collective farm, giving preference to their garden or field. Unfortunately such people are still to be met. The unconscientiousness and the awakening of the petty-bourgeois and philistine views in the individual person are not the only, not even the main cause for this. The imperfections of the mechanism which regulates the processes in this area and the insufficient power of the restrictions which limit the field of manifestation of the private plot can be blamed for such cases. If one citizen can take care of 500 sheep in his private plot, he will admittedly neglect his duties in the public sector. But who allowed the raising of so many sheep? Do we not have restrictive measures and agencies which have to see that laws are enforced? In any case, the fault is not with the policy, and that is why we should not throw out the baby with the bath water.

We can be satisfied that party and government made the right decision when they considered the private plot an important reserve in the national economy. Through its better use we will contribute to carrying out the process of comprehensive intensification. We should not restrain the development of the private plot, but rather help actively in solving the problem for fuller and quicker realization of the task of meeting the material needs of the people.

EXPLORATION, PRODUCTION OF GAS, OIL, 1979-1980

Zagreb NAFTA in Serbo-Croatian No 6, Jun 81 pp 277-285

[Article by Ifet Ibrahimasic and Nikola Cizmic, mining engineers of INA-Naftaplin; Ljubica Milovanovic, economist of Nafta-gas; and Damir Rajkovic, assistant in the School of Mining, Geology and Petroleum Engineering of Zagreb University; submitted 22 April 1981]

[Text] The article presents the results of explorations and production of petroleum and gas in the enterprises INA-Naftaplin and Nafta-gas in 1980 and production at INA-Nafta in Lendava. The basic characteristic of drilling activity is the increase of exploratory drilling over 1979 (a rise of 13 points, while production drilling increased only 2 percent). There was a 2-percent increase in petroleum production over 1979, but natural gas production dropped 2 percent; $4,244 \cdot 10^3$ tons of petroleum and 1,869 million cubic meters of natural gas were produced. The decline in natural gas production occurred as a consequence of the natural gas imported from the USSR. This especially affected the production of natural gas in Nafta-gas, which was down about 20 percent from 1979.

1. Activity of INA-Naftaplin in 1980

The results of exploration for petroleum and gas deposits and their exploitation in 1980 was characterized by a number of factors, such as:

- i. the making of purchases of equipment planned previously,
- ii. fulfillment of the schedule for explorations in SR [Socialist Republic] Croatia, and
- iii. enlargement of reserves of petroleum and gas and their inclusion in the production process.

These factors are mutually dependent. Because of discrepancies between them, there was a drop in the volume of activity, i.e., the program for medium-term development in effect was revised, and new guidelines were issued for activity

in the various fields in petroleum engineering of INA-Naftaplin covering the period 1978-1982. Explorations in 1980 also were conducted under very complex conditions as to the structure of rock strata in the deeper parts of the Pannonian Basin. Explorations in the northwest portion of the Adriatic on the platform "Panon" were also stepped up.

While capital construction was increased, the consumption of material and financial resources was rationed. In 1980 there was notable engineering and technological activity in all production units (OOUR's [basic organization of associated labor]), as follows: "Drilling," "Repair," "Production," "Special Mining Operations," "GIR" [geological explorations and field development] and "Commercial."

In operations to drill deep wells in 1980 total fulfillment was 90 percent of the plan, 69 percent of which was exploratory drilling and 119 percent was development drilling. This result in fulfillment of the drilling plan is related to certain unforeseeable difficulties, such as: the lack of casing pipe in the diameter 0.340 meter (13 3/8"), the time lost because of floods (Vrb-1, Br-1), and waiting that had to do with operational discrepancy between different technological activities, i.e., OOUR's ("Drilling," "Special Mining Operations," "Repair" and "Production").

Total drilling in 1980 was 196,153 meters. Development drilling was 135,774 meters, and exploratory drilling 44,991 meters in the Pannonian Basin, 3,923 meters in the Dinarids and 11,465 meters in the Adriatic.

Sixteen drilling rigs were anticipated to fulfill the drilling plan in 1980 (201,400 meters). However, 15.71 rigs were actually in operation, and the drilling per rig in 1980 was 12,486 meters, which is an increase of 164 meters over 1979 (12,322 meters).

The average depth of production wells in 1980 was 1,978 meters, while a value of 2,636 meters was attained for exploratory wells, representing an increase of 154 meters over 1979 for production wells and a decrease of 492 meters for exploratory wells.

Table 1. Results of Drilling by INA-Naftaplin in 1980

<u>Indicators</u>	<u>1979</u>	<u>1980</u>
1. Total drilling in meters	189,882.70	196,152.80
a) Exploratory drilling for petroleum and gas	57,703.20	60,378.50
b) Development drilling for petroleum and gas	132,179.50	135,774.30
2. Number of wells drilled	112	111
a) Exploratory drilling for petroleum and gas	27	34
b) Development drilling for petroleum and gas	85	77
3. Drilling success		
a) Total number of wells drilled	112	111
b) Positive for petroleum and gas	50	53
c) Dry (negative) wells	30	33
d) Wells being tested and also new projects	32	25

Table 1 (continued)

<u>Indicators</u>	<u>1979</u>	<u>1980</u>
4. Number of drilling rigs in operation	15.41	15.71
5. Meters drilled per rig	12,322	12,486

Activity of the INA-Naftaplin Work Organization by Technological Spheres of Operation in 1980

OOOR "Production"

Table 2 shows the results achieved in oil and gas production in 1980. It was achieved at 17 fields, of which the most important are Benicanci, Zutica, Struzec, Ivanic Grad, Klostar, Sandrovac and Jamarica. The other fields were less productive. In the process of exploiting the petroleum fields, aside from the primary procedure of extraction (natural drive), practical use was made of sub-surface pumps, gas lift and water flooding. Thanks to optimum utilization of reservoir patterns and conditions for raising petroleum to the surface, petroleum production in 1980 was 3,056,388 tons, which is a relatively satisfactory achievement. To this assertion we should add the difficulties in purchasing vital technical equipment such as: rocker-type pumping units, compressors, tubing and other material urgently necessary for supplemental treatment such as oil-water separation.

Table 2. Oil and Gas Production of INA-Naftaplin in 1980

	<u>Achieved in 1979</u>	<u>Achieved in 1980</u>
Petroleum, in tons	2,971,700	3,056,388
Gas, in thousands of cubic meters		
a) Natural gas	591,937	707,022
b) Casinghead gas	213,930	276,219.2
Total (a + b)	805,867	983,241.2
Liquefied gas, in tons	48,402	53,405

The shortfall of about 2 percent in gas production from the planned amount ($999,461 \cdot 10^3$ cubic meters) occurred because the Molve field was put into production behind schedule. In 1980 $453,814 \cdot 10^3$ cubic meters of gas were imported of the planned $517,539 \cdot 10^3$ cubic meters of gas. The reduction of imported gas depended on the supplier.

The amount of liquefied gas produced was 53,405 tons, which is 27 percent less than the output planned in 1980 (73,000 tons).

The reasons for this reduction in the production of liquefied gas are tardiness in putting the ethane installation on stream (scheduled for 1 July 1980) and repair work being done at the Kutina Nitrogen Fertilizer Plant.

OOUR "Drilling"

The results of drilling operations have been presented in Table 1.

OOUR "Repair"

The results achieved in repair work in 1980 exceeded those achieved in the previous year. Repair work was done at 637 wells, and of this 422 jobs were classified as current repairs. In the breakdown of total work of well repair, there was a 40-percent reduction in overcoming uncovered productive rock interspaces, while major overhauling of wells increased 44 percent. Major overhaul of equipment was also up 72 percent over 1979, and current repair work on equipment was up 10 percent. Total employment of repair cranes in 1980 was up 13 percent. Better organization of work (introduction of a third shift) and the increase in the number of repair rigs from 15 to 16 contributed to these results.

We should emphasize a particular difficulty for repair operations in activation of wells in the Drava Basin because of the high temperatures and pressures. In order to ensure the production of petroleum and gas in 1980 the operating capability of OOUR "Repair" was mostly employed in production fields. Various measurements and tests in wells, and production stimulation work to increase the flow of the wells were performed with difficulty because of the shortage of supplies and equipment: steel cable, chemicals for muds, tubing, perforation material, etc.

This past year, 1980, has been characterized by introduction of new facilities and equipment for repair operations, such as: the Cardwell-XIII repair installation, the Cardwell-XI (following the breakdown), National JVS-400 pumping units, a device for cleaning the threads on pipe, a device for testing the hermetic seal of joints in tubing and casing, new surface equipment, and subsurface equipment.

The most up-to-date technical equipment was used in equipping and testing deep exploratory wells (Stevkovica, Boksic, Kutnjak) and the very deep wells at Molve and Kalinovac (Mol-4, -11 and -12, and Kal-2). Extremely valuable experience was gained in this work which could be of tremendous benefit in future operations. Aside from these operations, OOUR "Repair" also recorded activity in 1980 in taking hydrodynamic measurements (measurements on a cable and measurements with a quartz manometer, referred to as the wire line technique, etc.).

A number of operations were performed at wells of Naftaplin, Nafta-gas and Nafta Lendava. An installation for work with liquefied nitrogen was employed, especially at the ethane and ethylene installation, the central gas station in Molve, and on gas pipelines. Thus nitrogen consumption in 1980 was threefold the figure envisaged in the plan. Because of the shortage of flexible tubing, the installation for this was not entirely utilized.

OOUR "Special Mining Operations"

The technology of "Special Mining Operations" in 1980 was characterized by difficulties in importing supplies, equipment and spare parts for special mining equipment (CA, electric well logging apparatus, etc.).

Difficulties were occasionally manifested in obtaining cement as well as chemicals for making "well cements" and those which are used in production stimulation operations. Toward the end of gradually resolving this problem (imports from abroad) specialists in the OOUR "Special Mining Operations" made an effort at substitution of imported supplies and equipment by domestic products such as Class C cement, hydrofluoric acid, oil for saws, filters to keep out sand, spare parts for surface and subsurface well equipment, containers for powders and liquids, etc.

The activity of the OOUR "Special Mining Operations" in 1980 was carried on in sectors according to the division of labor that has been adopted: technology of mining operations, mining measurements, maintenance and transport. Natural conditions related to drilling very deep wells in the Drava Basin represent the basic complexity in the productive activity of the OOUR "Special Mining Operations." The high temperatures (gradient 4-5.5° C/100 meters) and the hydrodynamic conditions in the wells represent technical difficulties to successful performance of electric logging measurements, the testing of wells (DST [(?) digital seismic test]), cementing strings of casing, etc.

Everything done in this field deserves to be emphasized as an achievement on which future technical and technological exploratory activity should be built.

OOUR "GIR"

Geological field exploration and development of INA-Naftaplin in 1980 confronted a number of new discoveries which were basic to the conduct of activities in the various fields of operation.

The main problems of exploration were related to the Pannonian Basin. The offshore Adriatic, including the locality J-18 which has been discovered, was an essential component in activity of establishing the commercial gas content of limestones, by contrast with the gas deposits previously discovered in the north-west portion of the Adriatic, in Quaternary sandy deposits and spatially separated deposits.

The region of the Dinarids is characterized by the regional nature of explorations, along with the importance of gathering petroleum-geological data.

Pannonian Basin

Exploratory work in this basin was conducted in all depressions, and particularly at the localities Molve, Zebanec, Voloder, Kutnjak and Klokočevci. Stari Gradec, Kalinovac (west), and other localities are unusually interesting.

During 1980 16 wells were drilled in the Pannonian Basin, while another 3 are in the process of drilling. The drilling done amounted to 44,990.6 meters. Exploratory drilling was carried on in the Sava, Drava and Mura depressions. Preparatory work for testing and equipping the wells was done at many localities.

Seismic measurements covered the region singled out for the drilling of prospecting wells as well as to round out the regional network of wells.

About 1,014 km of seismic profiles were run with 12-fold coverage. It was proven that the vibroseis is urgently needed as a source of seismic energy, especially in those regions where satisfactory results have not been obtained by the logging technique used up to now.

Geological studies and detailed engineering studies were prepared for many sites interesting from the standpoint of exploring hydrocarbon deposits.

Offshore Drilling in the Adriatic

The activity of offshore geological exploration in the Adriatic was stepped up last year. These operations included geology, geophysics and exploratory drilling. Data obtained previously on gas deposits in Quaternary sands and in Mesozoic carbonate rocks were reinterpreted. A study was prepared concerning the gas content of the locality referred to as No 18.

Marine seismic measurements were taken over 2,648.5 km of profile. Measurements were made of seismic velocities at the wells J-18/6 and J-18/4, and shallow seismic tests were made of the seabed at a total of eight locations. In addition, airborne thermal prospecting of the western coast of Istria was done in order to establish the distribution of occurrences of gas under the seabed.

During 1980 10 wells were drilled at locality No 13, total drilling amounting to 11,465 meters. This result was achieved in 8 months, and the rest of the time the platform "Panon" was employed on work in the Italian portion of the Adriatic seabed.

Last year four directionally drilled wells were drilled for the first time from the platform "Panon" from well J-18/8, and thus technical and technological experience was also gained in this way.

The Dinarids

Exploratory drilling in the Dinarids in 1980 consisted exclusively of the work of drilling the Poljice-1 well.

This work was characterized by problematical conditions which arise from well-known phenomena, such as complete losses of circulation, the grabbing of drilling tools, the breaking down of the walls of the bore hole, etc.

Drilling the Poljice-1 well has particular importance from the standpoint of regional exploration of the Dinarids with respect to narrowing the region to be explored for finding hydrocarbon deposits.

Activity of INA-Naftaplin Abroad

INA-Naftaplin maintained the continuity of its foreign operations in 1980. The areas of its involvement in exploration outside the country were expanded.

Korea

A work site was established in early 1980 for exploration and possible production of petroleum in Korea Bay. Geophysical work was completed in June 1980. The work was done by the GECO geophysical company from Norway. Further activity will continue depending on the results of the interpretation.

Gabon

After completion of work in drilling the first well, specialists of INA-Naftaplin reinterpreted the geological and geophysical data obtained. In early 1981 conclusions were drawn concerning the conditions for future involvement of INA-Naftaplin in a partnership with other companies in exploring hydrocarbon deposits in that country. We should also mention that Nafta-gas is one of the partners in explorations in Gabon.

Vietnam

INA-Naftaplin, in partnership with the German firm DEMINEX, has completed final interpretation of the geophysical and geological data obtained. The results are favorable. Since DEMINEX, as the operator, did not reach agreement with Petrovietnam on a particular change in the conditions of the contract concerning continuation of operations, they were terminated at the end of 1980 in what is referred to as exploration bloc 15.

However, in blocs 04 and 12 INA-Naftaplin has had a 10-percent share in exploration conducted jointly with AGIP of Italy and Hispanoil of Spain. During 1980 three wells were drilled, while one well was abandoned for technical reasons. Certain amounts of petroleum and gas were discovered, but they have no commercial value. AGIP made a complete study of the results of the explorations to date in that area, and the duration of INA-Naftaplin's further activity in Vietnam will depend on those results.

China

In 1980 INA-Naftaplin shared in the costs of seismic work done in the Yellow Sea with some 30 companies, among which ELF of France is the operator. The results of interpretation of the seismic data have been delivered to the appropriate authority in China. In the southern part of China the operator is AMOCO of America. The field work has been completed.

Interpretation of the geological data is under way, and the results will be processed by the spring of 1981.

Angola

The work organizations INA-Naftaplin and Nafta-gas have a 10-percent share in the costs of exploring bloc 3 of the offshore area of Angola, divided in equal 5-percent shares. The operator in this activity is ELF Aquitaine of France, which has a 50-percent share. The other partners are MOBIL with 25 percent and AGIP with 15 percent. The geophysical work began in late 1980.

Indonesia

A contract for exploration of the seabed of the eastern Java Sea in Indonesia was concluded with the Indonesian company PERTAMINA at the end of last year. INA-Naftaplin has a 20-percent share in the costs, while AGIP of Italy has a share of 50 percent and UNION Texas of the United States has a share of 30 percent. The geophysical work began during 1981.

INA-Naftaplin's Work Abroad as a Contractor

Drilling in Iraq on the basis of the contract in force was continued in 1980. The Emsco A-1500 drilling rig drilled a third well. Because of the events in Iraq (October 1980) the work was halted temporarily. INOC and INA-Naftaplin are negotiating the continuation of work with the Emsco A-1500 rig and expansion of drilling with a Cardwell rig and repair work with our equipment.

During 1980 a contract was concluded with AGIP to rent the platform "Panon" for drilling in the Italian portion of the Adriatic seabed.

In view of INA-Naftaplin's staff of specialized personnel, there are large opportunities for hiring out specialized petroleum engineers in many countries in the world. Favorable results have already been achieved in this respect (Vietnam and elsewhere).

Preparations were made in 1980 for contracts on involvement of foreign partners in exploring a portion of the Adriatic seabed. The taking of bids is now under way, and an exploration program is being drafted.

Exploration in the seabed of the middle Adriatic will be stepped up with the acquisition of semisubmersible platforms (by purchase or construction in Yugoslav shipyards).

INA-Naftaplin's Technical and Technological Activity in Field Development

Exploitation of existing petroleum and gas fields and development of newly discovered fields involves the use of a number of technical and technological procedures on which attainment of the optimum economic extraction will depend. On the basis of studies of each individual field structure and the natural conditions of the reservoirs the appropriate studies were compiled on petroleum and gas reserves, and the various fields were evaluated.

In fields with known hydrocarbon reserves, depending on the effectiveness of application, the method used is to maintain reservoir pressure by injecting water into petroleum reservoirs, such as: Ivanic (since 1972), Zutica (since 1976) and Benicanci (since 1975). Other smaller fields were examined in the same context in 1980.

In 1980 77 development wells were drilled, 5 of which are in the phase of completion. Total development for field development was 135,774.3 meters. This made it possible to maintain the level of petroleum and gas production from existing fields for the future. By regulating field exploitation and by programming drilling operations optimum extraction of petroleum and gas has been achieved.

Automatic data processing in this work has contributed to more effective activity of INA-Naftaplin in exploring deposits and in the production of hydrocarbons.

OOUR "Commercial"

The past year has been characterized by the measures adopted in the country for economic stabilization. During 1980 a number of problems were solved in INA-Naftaplin related to the purchase, sale and storage of supplies and equipment urgently necessary to carrying on the technological process of exploration and exploitation of petroleum and gas fields in SR [Socialist Republic] Croatia. We should emphasize that these measures, especially the shortage of foreign exchange, had an adverse effect on the necessary adjustment of capacity of all OOUR's in INA-Naftaplin and also on the purchase of producer goods. By the end of last year and in early 1981 this was affecting the production of petroleum and gas and also the discovery of new reserves of hydrocarbons.

Fundamental Problems in the Future Activity of INA-Naftaplin

The need for sources of energy, on which the country's economic development depends, necessitates programmed exploration of the rest of the interesting reservoir structures under the land and sea. The drilling to ever greater depths (5,000-6,000 meters and deeper) involves a number of problems: that is, from the necessary investment of considerably greater financial resources in exploration to the technical and technological difficulties of overcoming the more complicated natural conditions involved in the location of the petroleum and gas reservoirs. Very deep wells open up rock strata with occurrences of hydrogen sulfide, which figures as the most adverse factor in the processes of drilling wells and exploiting deposits. Special technical and protective equipment and many inhibiting materials must be used to eliminate its well-known destructive and dangerous effect. In addition, the high geothermal gradients in the deep Pannonian Basin put a limit on the range of application of existing technical equipment. The presence of carbon dioxide in natural gas is also adverse because of corrosion of steel and the necessary treatment of the gas during the process of exploiting the field. The hydrodynamic conditions in the wells in certain regions being explored are very complicated, which necessitates a search for more up-to-date technical and technological solutions. Many of them involve the direct purchasing of technical equipment and expensive specialized devices abroad.

In view of these and other factors in present and future activity, we can say that personnel in all specialized disciplines within the work organization INA-Naftaplin face a strenuous commitment of their mental and physical efforts.

2. Exploration, Drilling and Production of Petroleum and Gas by the Work Organization Nafta-gas in 1980

Exploratory operations were conducted during 1980 in Vojvodina, parts of Serbia proper, Kosovo and abroad.

The preparation of studies and scientific research occupied an important place in 1980, as exemplified by preparation of the Study of the Level of Exploration and Potential Possibilities of Discovery of New Reserves of Petroleum and Gas in SAP [Socialist Autonomous Province] Vojvodina, Analysis of the Status and Possibility of Exploring "Nonstructural" Traps in SAP Vojvodina, Status and Program of Exploration and Exploitation of Thermal and Thermal Mineral Waters, Program for Exploring the Application and Sale of Thermal Mineral Waters and Geothermal Energy, preparations for drafting the Study Evaluating the Promise of Petroleum and Gas Exploration in SR Bosnia-Herzegovina, Study of the Petroleum-Geological Characteristics and Evaluation of the Promise of the Exploratory Area Garet Tes-selit in Algeria and Study of the Promise of the Exploratory Area Cama Marin in Gabon, and work continued on the study "Evaluation of the Technical and Technological Feasibility of Using Secondary Recovery Methods at Existing Oil Fields in SAP Vojvodina."

Geological Work

Geological work consisted of supplemental explorations of northern and north-western Serbia (Macva and the Sava Valley), covering an area of about 5,300 square kilometers, and within SAP Kosovo on the sheets [?] Prizren, Kacanik, Kukes and Gostivar.

Exploration of oil shale was conducted in the Vranje, Krusevac and Vranje-Mionica basins.

Geophysical Studies

Geophysical studies were conducted using geomagnetic (aeromagnetic) and seismic reflection methods, and they were conducted both in areas of SAP Vojvodina as well as in areas of Serbia proper.

Geomagnetic measurements were taken using aeromagnetic methods in areas of Srem and Backa over an area of about 11,000 square kilometers.

Seismic studies were conducted by the reflection method with multiple coverage on areas of SAP Vojvodina amounting to 1,130 square kilometers and SR Serbia amounting to 358 square kilometers. The seismic studies were mainly detailed in character, and their purpose was to discover new localities or define existing ones more closely in areas of SAP Vojvodina (environs of Kikinda, Vojvoda Stepa,

Vladimirovac--Banatsko Novo Selo--Dolovo, Turija--Backo Gradiste--Gospodjinci--Zabalj) and Serbia proper (the broader environs of Pozarevac, Ritopek--Begoljica--Kamendol, and the Mlava Basin).

Operations Abroad

Total investments during 1980 in operations abroad amounted to 219,937,000 dinars.

People's Democratic Republic of Algeria

Work was done in 1980 to carry out the 1979 contract. A wholly owned company Nafta-gas Algeria was established and entered in the register in Algeria. A geological and geophysical study was made of the exploration area Aret Tessalit and seismic operations in this area were programmed on that basis.

Field seismic operations were conducted in area No 1, which was promising, and 390 km of seismic profiles (11 profiles) were run, and this work was done by the DTP [expansion unknown] seismic team.

At the end of December preparatory work was done for letting the contract for seismic work, which is to be done by the Geophysical Institute of Belgrade.

Tunisia

On the basis of the results obtained from the first exploratory well Neapolis-1 (written off as negative) at the Enfida concession in Tunisia. After performance of these exploratory operations Buttes prepared a study on the feasibility of this concession and proposed a new program of exploration. The plans call for preparing another 700 km of seismic profiles and drilling two exploratory wells. The partners in financing these operations are AGIP, Nafta-gas and Petroswed. SP Buttes is in the process of transferring the position of operator to AGIP.

Gabon

On the basis of work done so far in the exploratory area Cama Marin a study assessing the promise of the next exploratory area of this concession was prepared. The assessment was that the promise of this concession has been diminished considerably and the risk of further exploration has increased. An agreement was reached with the partners that the French firm ELF Gabon take over the obligation to finance 60 percent of the costs of the exploratory well which is to be drilled within a period of time allowed by performance of operations required under the contract.

The site will be proposed by ELF Gabon after a new interpretation of the seismic data.

People's Democratic Republic of Korea

Field seismic work has been completed on the offshore concession in Korea amounting to 2,536 km of seismic profiles, as well as gravimetric and geomagnetic measurements in the concession. Upon receipt of other seismic profiles and also the gravimetric and magnetic measurements, these measurements were conducted by the Norwegian company GECO. Work will be done to interpret the results of these measurements, and that will serve as the basis for adopting a program of operations for 1981.

China

During 1980 the processed seismic profiles and data of gravimetry and magnetometry were received on the concession in the Yellow Sea in China, and geological data were purchased from the Chinese for two exploratory wells (Huang 4 and Huang 6), which were drilled within the exploratory area in which the seismic measurements are being made. Analyses of samples taken from these wells were also obtained.

Geophysical data for these areas in the Yellow Sea are now being interpreted. The geophysical interpretation is being done by the Geophysical Institute of Belgrade.

This interpretation will be used by Nafta-gas as material for preparing the study assessing the promise of this area as a participant in this geophysical program.

Angola

In late 1980 a group of partners was formed to explore for petroleum in offshore bloc 3 in Angola. Aside from ELF Aquitaine of Angola (the operator), the other participants are AGIP, Mobile Oil, Naftaplin and Nafta-gas.

It has been agreed that in addition to the documentation that exists, approximately 6,400 km of seismic profiles, gravimetry and magnetometry would be done, and eight exploratory wells would also be drilled during the exploration period, three of them in 1981.

Geophysical measurements and processing are to be done by the French firm C. GG. By the end of 1980 5,710 km of seismic, gravimetric and magnetometric measurements had been done.

Drilling and Testing for Petroleum, Gas and Thermal Waters

The purpose of drilling has been to explore and discover new deposits or to define and establish the contours of deposits discovered previously. In 1980 75 wells were drilled. Drilling for petroleum and gas was done with 10 drilling rigs, and the average depth (oil and gas wells) was 1,826 meters (2,385 meters of exploratory wells and 1,465 meters for development and production wells).

Table 3. Drilling Results

<u>Indicators</u>	<u>1979</u>	<u>1980</u>
1. Total drilling in meters	120,757	13,422
a) Exploratory drilling for petroleum and gas	56,087	64,498
b) Exploratory drilling for thermal waters	2,537	6,387
c) Development drilling for petroleum and gas	62,133	61,537
2. Number of wells drilled	64	75
a) Exploratory for petroleum and gas	24	27
b) Exploratory for thermal waters	4	6
c) Development-production wells for petroleum and gas	36	42
3. Drilling success	64	75
a) Positive for petroleum and gas	41	45
b) Positive for water	2	2
c) Negative	10	8
Petroleum and gas	--	7
Water	--	1
d) Being tested for petroleum and gas	11	17
e) Being tested for water	--	3
4. Number of rigs in operation	9	10
5. Meters drilled per rig (for petroleum and gas)	13,136	132,422

Petroleum and Gas Production

During 1980 Nafta-gas produced a total of 1,183,000 tons of petroleum and 876 million cubic meters of gas.

Table 4

<u>Indicators</u>	<u>Results for 1979</u>	<u>Results for 1980</u>
Petroleum in tons	1,167,610	1,183,293
Gas in thousands of cubic meters	1,103,656	875,695
a) Natural gas	995,521	728,523
b) Casinghead gas	108,135	147,173

3. Results of Drilling in Yugoslavia in 1980

The results of drilling in 1980 indicate augmented activity of explorations, which is altogether in line with the fact that as much petroleum as possible needs to be furnished from domestic production. In view of our country's great dependence on imports, this is the only way of offsetting to some extent the adverse effect of the steady rise of petroleum prices on the world market. That is why more attention was paid in 1980 to exploratory drilling in order to discover new deposits or to find and activate deposits already discovered.

The volume of exploratory drilling in the SFRY was 131,264 meters in 1980, which is 13 percent more than in 1979. Of this the volume of exploratory drilling by

Nafta-gas increased 20 percent, while that of INA-Naftaplin was 5 percent. The level of production well drilling by and large stayed at the level of last year, increasing a total of 2 percent.

The results achieved can be regarded as satisfactory for several reasons. Drilling activity, exploratory drilling in particular, has been done at ever greater depths, where the conditions are considerably more adverse (high pressures, temperatures, greater solidity of the rocks being drilled, etc.). The reasons for this is the ever greater degree of exploration, above all of the Pannonian Basin, which is the only region producing in Yugoslavia, as well as the ever greater activity in the Dinarids and especially in the Adriatic, where the drilling conditions are considerably different.

This to some extent indicates the level of risk in exploration, which is manifested in the share of negative wells, which runs nearly 50 percent (47.7 percent) in INA-Naftaplin; in Nafta-gas it is somewhat lower, but still considerable, and amounts to 32 percent.

In addition, there is the constant problem of difficulty in obtaining expensive specialized equipment from abroad because of restricted imports and the shortage of foreign exchange. And, third, in spite of the more difficult operating conditions, the output per rig has remained unchanged, which suggests the conclusion that performance has improved.

Table 5. Results of Drilling in Yugoslavia in 1980

<u>Drilling Results</u>	<u>1979</u>	<u>1980</u>	<u>Index 80/79</u>
INA-Naftaplin			
1. Total drilling in meters	189,883	196,153	103
a) Exploratory drilling	57,703	60,379	105
b) Production wells	132,180	135,774	103
2. Number of wells drilled	112	111	99
a) Exploratory	27	34	130
b) Production	85	77	91
3. Drilling success*			
a) Positive wells	57	58	102
b) Negative wells	55	53	96
c) Share of negative wells in total wells drilled (%)	49.10	47.70	97
4. Number of rigs in operation	15.41	15.71	102
5. Number of meters drilled per rig	12,322	12,486	101
Nafta-gas			
1. Total drilling in meters	120,757	132,422	110
a) Exploratory drilling	58,624	70,885	121
b) Production wells	62,133	61,537	99

Table 5 (continued)

<u>Drilling Results</u>	<u>1979</u>	<u>1980</u>	<u>Index 80/79</u>
2. Number of wells drilled	64	75	117
a) Exploratory	28	33	117
b) Production	36	42	117
3. Drilling success*			
a) Positive wells	45	51	113
b) Negative wells	19	24	126
c) Share of negative wells in total wells drilled (%)	29.70	32.00	108
4. Number of rigs in operation	9	10	111
5. Number of meters drilled per rig	13,417	13,244	99
Total			
1. Total drilling in meters	310,640	328,575	106
a) Exploratory drilling	116,372	131,264	113
b) Production wells	194,313	197,311	102
2. Number of wells drilled	176	186	106
a) Exploratory	55	67	140
b) Production	121	119	98
3. Drilling success*			
a) Positive wells	102	109	107
b) Negative wells	74	77	104
c) Share of negative wells in total wells drilled (%)	42.50	41.00	96
4. Number of rigs in operation	24.41	25.71	105
5. Number of meters drilled per rig	12,726	12,780	100

* In classifying wells being tested as positive and negative, 20 percent were tabulated as positive and 80 percent negative.

4. Petroleum and Gas Production in Yugoslavia

The total growth of petroleum production in Yugoslavia in 1980 was 99,000 tons, or slightly more than 2 percent over the previous year. Over that same period gas production dropped 2 percent, which was because of the considerably smaller production of gas by Nafta-gas (production was down 21 percent). Gas production increased 22 percent over 1979 in INA-Naftaplin.

This kind of production was achieved mainly from existing fields through optimum regulation of reservoir conditions and better use of the available operating time of oil drilling bits.

If in this connection we take into account the effect of natural depletion, which averages 8-12 percent per year, and certain difficulties in acquiring urgently needed equipment and certain supplies for supplemental treatment of rocks

and petroleum, then this production can to some extent be regarded as a satisfactory achievement.

Table 6. Petroleum and Gas Production in Yugoslavia

<u>Petroleum Production, 10³ tons</u>	<u>1979</u>	<u>1980</u>	<u>Index 80/79</u>
INA-Naftaplin	2,972	3,056	103
Nafta-gas	1,168	1,183	101
INA Nafta, Lendava	<u>5</u>	<u>5</u>	<u>100</u>
Total	4,145	4,244	102
 <u>Natural Gas Production, millions of cubic meters</u>			
INA-Naftaplin	806	983	122
Nafta-gas	1,104	876	79
INA Nafta, Lendava	<u> </u>	<u> </u>	<u> </u>
Total	1,910	1,869	98

7045

CSO: 2800/344

PETROLEUM REFINING, 1979-1980

Zagreb NAFTA in Serbo-Croatian No 6, Jun 81 pp 286-289

[Article by Vilim Boranic, chemical engineer, Zagreb; submitted 15 May 1981]

[Text] On the basis of the available data the article analyzes trends in petroleum refining in 1979 and 1980. Because of difficulties in purchasing petroleum refining in 1980 was 7 percent less than in the previous year, i.e., it amounted to 14.8 million tons. Because of the diminished amounts of imported petroleum, its share dropped relative to that of domestic petroleum. The level of production of the various petroleum products, as in the past, depended on the available secondary refining processes and also the needs of the market.

The operation of the refineries in 1980 was impeded for several reasons--irregular and tardy delivery of imported petroleum (whose importation has been diminished) had an impact on planned utilization of available capacities, and the further rise in the price of petroleum as well as of supplies and producer goods, when there were ceilings on the prices of the finished products, had an adverse effect on the economics of operation.

Table 1. Petroleum Refining in Yugoslavia

Year	Domestic Petroleum		Imported Petroleum		Total	
	10 ³ t	%	10 ³ t	%	10 ³ t	%
1979	4,081	25.8	11,740	74.2	15,821	100.0
1980	4,232	28.6	10,565	71.4	14,797	100.0
Index	103.7	--	90.0	--	93.5	--

According to figures published in the Statistical Bulletin (Vol 1, No 2) of the General Association of Organizations of the Yugoslav Petroleum Industry an analysis has been made of petroleum refining in 1980 as a whole, i.e., without entering into the problems of the particular refineries. We should mention that the figures for 1979 as given for certain items in that bulletin differ from those published in NAFTA, 31, pp 288-293 (No 6, 1980), since at that time the data were preliminary.

In 1980 a total of 14.8 million tons of petroleum was refined, which is 6.5 percent less than in the previous year, when 15.8 million tons were refined, which means a drop of 1 million tons. The relations between the amounts of domestic and imported petroleum refined over the last 2 years is shown in Table 1.

As we see from the table, the quantity of domestic petroleum refined increased from 4,081,000 tons in 1979 to 4,232,000 tons in 1980, or by 151,000 tons, which is an increase of 3.7 percent. This is the largest increase over the last 3 years; that is, in 1978 the increase of domestic petroleum refined was 115,000 tons, and in 1977 it was 59,000 tons.

On the other hand in 1980 slightly more than 10.5 million tons of imported petroleum were refined, as against 11.7 million tons in 1979, which is nearly 1.18 million tons less, for a drop of 10 percent. It is a number of years since the amount of imported petroleum refined has decreased.

The share of domestic petroleum in total refining increased from 25.8 percent in 1979 to 28.6 percent in 1980, while the share of imported petroleum dropped from 74.2 percent to 71.4 percent.

Domestic petroleum was refined by refineries favorably located relative to the oil fields, while imported petroleum was distributed according to the agreement among the refineries.

Primary capacities for petroleum refining amounted to 25.5 million tons in 1980, and when this is compared to the petroleum refined, the average utilization of capacity was only 58 percent. New facilities for primary refining of petroleum were completed at the refinery in Bosanski Brod in late 1980, and their effect will be felt only this year.

The new refinery in Skopje (2.5 million tons per year) will for technical reasons go into trial operation this year, while construction of new facilities for petroleum refining at Lendava have been halted; that is, the construction would come into consideration only after 1985.

Since the refineries have been refining all the available quantities of domestic petroleum, the importation of petroleum had to be the regulator in meeting the country's demand for petroleum products. But the quantity of imported petroleum was planned at a lower level for financial reasons that have to do with foreign exchange, but even this diminished amount of imported petroleum, for financial and technical reasons, did not keep pace with demand during the year, and from time to time there were shortages on the market of certain petroleum products. The imbalance was corrected by importation of finished petroleum products and the export of surpluses as an interventionary measure.

Table 2 shows the production of the principal product groups, whose level, as in the past, depended on the characteristics of the petroleum refined, the facilities available for refining and finishing, and the needs of the market, which varied considerably in pattern in the winter and summer months.

The table gives separately the production for the market and the internal consumption of the refineries and the loss in refining.

Table 2. Yields of Petroleum Refining in Yugoslavia

Product	1979		1980		Index
	10 ³ t	%	10 ³ t	%	
Motor gasoline	2,413	14.9	2,188	14.5	90.7
Jet fuel and kerosene	332	2.0	335	2.2	100.9
Diesel fuel, household heating oil and extralight heating oil	4,755	29.5	4,482	29.6	94.3
Furnace oil	5,077	31.5	4,572	30.2	90.1
Asphalt	739	4.6	643	4.3	87.0
Other products	1,656	10.3	1,723	11.4	104.0
Total for the market	14,972	92.8	13,943	92.2	96.2
Internal consumption	892	5.5	923	6.1	103.5
Refining losses	273	1.7	262	1.7	96.0
Petroleum refined and additives	16,137	100.0	15,128	100.0	93.7

As is evident from the table, the yields of products in 1980 did not change essentially from 1979, except in the case of furnace oil, whose share in 1980 was 30.2 percent, against 31.5 percent in 1979, and "Other products" whose share increased from 10.3 percent to 11.4 percent.

Motor gasoline production in 1980 was 2,188,000 tons, while in 1979 it was 2,413,000 tons, or 225,000 tons less, a drop of 9.3 percent. The reason was on the one hand the reduced demand of the market (2,152,000 tons as against 2,359,000 tons) and the increased production of primary gasoline on the other hand (897,000 tons as against 844,000 tons). Relative to the petroleum refined, the share of motor gasoline in 1980 was 14.5 percent, while in 1979 it was 14.9 percent.

The production of jet fuel and kerosene increased in 1980 by only 3,000 tons, or 0.9 percent: from 332,000 tons in 1979 to 335,000 tons last year. That is why the share relative to the petroleum refined rose slightly: from 2.0 to 2.2 percent.

The product group consisting of the so-called intermediate distillate, i.e., diesel fuel, household heating oil and extralight heating oil, had a production in 1980 of 4,482,000 tons, as against 4,755,000 tons in 1979, which means a drop of 273,000 tons, or 5.7 percent. Nevertheless, the share relative to the petroleum refined remained almost the same. In 1979 it was 29.5 percent, and in 1980 it was 29.6 percent. The level of production depended on the petroleum available and the demand of the market.

The production of residual furnace oil--not including internal consumption--was 4,572,000 tons in 1980, as against 5,077,000 tons in 1979. A drop, then, of 505,000 tons, or 9.9 percent. The share relative to the petroleum refined dropped from 31.5 percent in 1979 to 30.2 percent in 1980.

The largest drop in production, 13 percent, was recorded for asphalt. In 1979 this production was 739,000 tons, and in 1980 643,000 tons. The share relative to the petroleum refined dropped from 4.6 to 4.3 percent.

In the case of the so-called "Other products," which are primary and special gasolines, white spirits, aromatic, petroleum coke, lubricant oils and greases, and paraffin, production increased by 67,000 tons, or 60 percent. That is, 1979 output was 1,656,000 tons, while in 1980 it was 1,723,000 tons, and the share rose from 10.3 percent in 1979 to 11.4 percent in 1980.

This means that in spite of the diminished quantity of petroleum refined, the refineries managed to produce a larger quantity--in large part--of better-quality products.

Viewed as a whole, the quantity of products destined for the market dropped about 1 million tons, or 3.8 percent.

The internal consumption of the refineries increased from 892,000 tons in 1979 to 923,000 tons in 1980, which is 31,000 tons, or 3.5 percent. Relative to the petroleum refined the share of internal consumption in 1980 was 6.1 percent, as against 5.5 percent in 1979. The reason for this is the suboptimal use of facilities for primary petroleum refining because of the smaller quantities of petroleum refined.

Table 3. Relations Among the Principal Products in Petroleum Refining

Product Groups	1979		1980		Index
	10 ³ t	%	10 ³ t	%	
Motor and primary gasoline	3,257	20.2	3,085	20.4	94.7
Intermediate distillates	5,087	31.5	4,817	31.8	94.7
Residual products	6,708	41.6	6,138	40.6	91.5
Other products and loss	1,085	6.7	1,088	7.2	100.3
Petroleum refined and additives	16,137	100.0	15,128	100.0	93.7

Nevertheless, losses in refining dropped 4.0 percent; in 1980 they amounted to 262,000 tons, and in 1979 they were 273,000 tons, which means a drop of 11,000 tons.

Table 3 shows the relations among the four principal product groups:

- i. motor and primary gasoline,
- ii. intermediate distillates, i.e., jet fuel, kerosene, diesel fuel, household heating oil, extralight heating oil,
- iii. residual products, i.e., furnace oil together with internal consumption and asphalt,
- iv. all other products and loss.

As is evident from Table 3, a drop in output was recorded over the previous year for all products in 1980--except for "Other products and loss" (taken together), where the result was unchanged. Further, the first three product groups comprised 93.3 percent of the initial raw material in 1979, and the figure in 1980 was 92.8 percent. The largest drop in production (9.5 percent) was for residual products, whose share in refining was 40.6 percent in 1980 and 41.61 percent in 1979. We should emphasize that these shares are averages, since at the new refineries, which have capacities for secondary refining by conversion, the yields of residual products are even below 30 percent, while at the other refineries these shares are considerably higher than 40 percent.

The share of "Other products and loss," taken together, increased from 6.7 percent in 1979 to 7.2 percent in 1980, although the absolute sum remained almost the same: 1,085,000 tons as against 1,088,000 tons. The production of lubricants in the refineries and enterprises which prepare them by purchasing the necessary components totaled 162,000 tons in 1980 as against 182,000 tons in 1979. Motor oil accounted for 91,000 tons of this in 1980 (100,000 tons in 1979), industrial oil 67,000 tons (as against 76,000 tons) and mineral lubricant greases 4,000 tons (6,000 tons). Difficulties in purchasing components had an essential impact on the production of lubricants--especially in the case of manufacturers who import the necessary components.

During 1980 the refineries once again, in spite of the difficulties which they faced, took it as their permanent task to make considerable efforts to maintain the high quality of their products achieved in the past, and they also introduced certain new lubricants with an improved level of quality. In so doing they showed concern about the ever stricter standards of consumers, and they also tried in their work to reduce environmental pollution to the maximum possible degree.

Aside from the refining of petroleum, the year 1980 was also difficult for the refineries in the field of expanded reproduction, and the construction of certain installations was slowed down, and that of others halted indefinitely. Yet certain installations were completed and went on stream. Thus at the end of 1980 the refinery at Bosanski Brod completed construction of a new installation for primary petroleum refining, and, together with the available installations it already had, it is able to refine 5.5 million tons of petroleum annually, and facilities were built for production of blown oil in Novi Sad. A new catalytic cracking facility at the refinery in Rijeka is near completion.

The year 1980 was the last year of the 5-year planning period covering activity from 1976 to 1980. It is therefore of interest to compare the achievements in that period to the projections covering the same period.

The plan for the period from 1976 to 1980, which was drawn up immediately after 1973, when it was not yet possible to foresee the consequences of the rise of petroleum prices, adjusted the refining of petroleum to the consumption of its products. It accordingly envisaged a development of refinery capacity to reach 27.6 million tons of annual petroleum refining capacity in 1980. The plan also provided that all the domestic petroleum produced would be refined in refineries,

along with amounts of imported petroleum so that together they would regularly meet the country's needs for petroleum products, which foreseeably could have reached about 19 million tons. Within that framework it was envisaged that petroleum imports would increase at an annual rate of about 9.6 percent, so that they would amount to 13.9 million tons in 1980. In addition, the construction of primary and secondary petroleum refining facilities would be so oriented that the ratio of white to black products would be 75:25.

Table 4. Refinery Yields in the Period From 1976 to 1980

	10 ³ tons					Growth Rate
	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1976-1980</u>
Petroleum refined						
Domestic	3,880	3,868	3,983	4,081	4,232	2.2
Imported	<u>7,901</u>	<u>9,967</u>	<u>10,245</u>	<u>11,740</u>	<u>10,565</u>	<u>7.5</u>
Total	11,781	13,835	14,228	15,821	14,797	5.8
Products obtained						
Motor gasoline	1,923	2,190	2,301	2,413	2,188	3.3
Jet fuel	325	330	299	332	335	0.7
Diesel fuel, household heating oil and extra-light heating oil	2,969	4,147	4,268	4,755	4,482	10.7
Furnace oil	3,975	4,559	4,638	5,077	4,572	3.6
Asphalt	391	537	635	739	643	13.2
Other products	1,197	1,012	1,213	1,656	1,723	9.5
Internal consumption	825	868	865	892	923	2.9
Refining loss	176	212	281	273	262	10.4

We should emphasize that these planning projections were not altogether fulfilled.

Refinery capacity amounts to 25.5 million tons per year, which is less than the projected 27.6 million tons per year, but if construction of new facilities at the refinery in Bosanski Brod and the new refineries in Skopje and Lendava had been entirely built by 1980, total capacity would have been 31.9 million tons per year, that is, far higher than the planning projections, and even further above real needs.

Construction of secondary refining facilities has been behind schedule, and in 1980 the average ratio of white products to black was 60:40, even though the refineries with complex technological process are already coming close to the ratio that was sought.

During the last year covered by the plan petroleum imports were down, and the average growth rate of imports over the 5-year period was 7.5 percent instead of

the projected 9.6 percent. The trend of annual yields of the various products over the period from 1976 to 1980 is shown in Table 4. It is evident from that table that total petroleum refining increased over that period from 11.8 million tons in 1976 to 14.8 million tons in 1980, or at an average annual rate of 5.8 percent. Petroleum refining in 1980 was only 569,000 tons greater than in 1978.

The trend in the production of the various products showed a varying dynamic behavior; the highest growth rate (after asphalt) was for the diesel fuel group, where the rate was 10.7 percent, and motor gasoline (3.3 percent) and furnace oil (3.6 percent) had a low growth rate.

However, examination of the causes of the different growth rates for the various products goes beyond the scope of this analysis.

7045

CSO: 2800/344

PRICES, IMPORTS, CONSUMPTION OF OIL PRODUCTS

Zagreb NAFTA in Serbo-Croatian No 6, Jun 81 pp 290-293

[Article by Vojteh Brajčić, vice chairman of the business committee of INA "Trade" in Zagreb; submitted 14 April 1981]

[Text] The basic characteristics of developments on the Yugoslav market of petroleum derivatives over the past year, 1980, can be reduced to two observations. First, the high prices of derivatives along with stagnation (and decline) of real personal incomes tended to diminish the demand for derivatives which are part of personal consumption. Second, the occasional shortage of certain derivatives, gas oils and heavy heating oils above all, particularly at the beginning of the year, led to forced conservation and a somewhat lower consumption than that which probably would have occurred if there had been enough derivatives.

By and large the past year occurred on the Yugoslav petroleum derivative market in the context of two tendencies which have both tended to diminish consumption of petroleum derivatives in our country.

The prices of petroleum derivatives (Table 1) increased in nominal terms 58-85 percent over the previous year. If we adjust these values for the rise in the cost of living, which was 30 percent, we get a 22-percent growth rate of prices for, say, gasoline. Since personal incomes have not been keeping pace with the cost of living, this growth rate is about 7-8 percent higher in real terms, or a total of 30 percent for gasoline, 35 percent for diesel fuel, 50 percent for household heating oil and 40 percent for heavy furnace oil.

Assuming an elasticity coefficient of motor gasoline consumption of 0.3, it would be realistic to expect consumption to drop about 9 percent per vehicle, which by and large is what happened. According to the figures of the Bureau of Statistics, a total of 255 passenger vehicles were produced in Yugoslavia in 1980, of which 25,000 were exported, while at the same time 42,000 cars were imported. If we take into account the scrapping of old vehicles, we can conclude that at the end of last year Yugoslavia had 2,532,000 registered passenger cars, as against 2,419,000 cars recorded a year earlier, or only 4.5 percent more, which would be the lowest growth we have experienced in recent years.

In 1980 7.7 million foreign vehicles crossed the border, which is a drop of 22 percent from the 9.8 million that crossed it in 1979. By and large the drop occurred in local border traffic, while the number of foreign tourists increased from 6.0 million to 6.4 million, and the number of nights which foreign tourists spent in lodgings increased from 33.5 million to 37 million. Total gas sales in this sector, however, were down about 80,000 tons, and are estimated at about 300,000 tons, or 14 percent of total gasoline consumption in Yugoslavia. In 1980 a total of 2,117,859 tons of motor gasoline were sold, as against 2,328,556 tons in 1979, which is a drop of 8 percent.

Consumption per passenger car, when we exclude consumption by other vehicles and foreign passenger cars, was 688 kg, as against 789 kg in 1980. By comparison with the last year before the crisis, which was 1973, when consumption per vehicle was 929 kg, this is a drop of 26 percent. Thus in the average consumption per vehicle we found ourselves in the company of Italy, France and certain other countries at the bottom of the ladder of European countries in this respect.

The prices of household heating oils, which rose from 4.51 dinars in 1979 to 8.33 dinars in 1980, or 85 percent, had a restricted effect on consumption. The rise in real terms, adjusted by the cost-of-living index, was 42 percent, and all of 50 percent if we include the drop of personal incomes.

Taking the elasticity coefficient, which is 0.4 here, we might have expected consumption to drop as much as 20 percent, at least as far as general consumption is concerned, and it accounts for about 70 percent of the total consumption of these derivatives. On the average, since prices obviously did not tend to bring about a decline in consumption in the public sector, it was realistic to expect a 15-percent decline in consumption of extralight heating oils. The actual decline of consumption, however, was 6 percent, to which the exceptionally severe winter, which also affected part of 1980, certainly contributed, since under normal circumstances it would have increased consumption about 10-15 percent over its normal level. Total consumption of extralight heating oil was 1,695,044 tons, as against 1,796,621 tons in 1979.

Table 1. Nominal and Real Prices of Petroleum Derivatives in Yugoslavia 1973-1979

<u>Sales Prices</u>	<u>1973</u>	<u>1979</u>	<u>1980</u>	<u>Index 80/79</u>	<u>Index 80/73</u>
Average Nominal Prices Per Liter					
1. Motor gasolines	3.18	11.24	17.74	158	558
2. Diesel fuels	1.69	8.10	13.46	166	796
3. Extralight heating oil	1.40	4.51	8.33	185	595
4. Heavy heating oil	0.69	2.69	4.62	172	670
Average Real Prices Per Liter*					
1. Motor gasolines	11.09	14.54	17.74	122	160

Table 1 (continued)

<u>Sales Prices</u>	<u>1973</u>	<u>1979</u>	<u>1980</u>	<u>Index 80/79</u>	<u>Index 80/73</u>
2. Diesel fuels	5.88	10.52	13.46	128	229
3. Extralight heating oil	4.87	5.87	8.33	142	171
4. Heavy heating oil	2.39	3.50	4.62	132	193

* Remark: The real prices were computed on the basis 1980 = 100 according to the cost-of-living trend (INDEKS, No 2, 1981, Federal Bureau of Statistics, Belgrade). Cost-of-living indices 1980/1979 = 130; 1980/1973 = 348. The index numbers of the real growth of personal incomes 1980/1979 = 93.

The nominal prices of diesel fuel last year rose 66 percent, which in real terms represents an increase of about 35 percent. At an elasticity coefficient of 0.1, we might have expected consumption to drop about 3 percent. Actually it recorded a 2-percent drop.

The number of trucks in 1979 increased by 18,000 which were produced in domestic factories and 3,500 which were imported. The number of tractors increased from 297,000 in 1979 to about 325,000 in 1980.

Public highway carriers showed a 2-percent drop in passenger traffic in 1980 over the previous year. The volume was 928 million passengers, as against 950 million in 1979. Freight traffic in 1980 was 18.9 billion ton-kilometers, as against 17.7 billion ton-kilometers in 1979, or an increase of 7 percent. Everything we have said resulted in a consumption which was 2,948,000 tons in 1980, as against 3,005,000 tons in 1979.

The prices of residual fuel oil in 1980 rose 72 percent in nominal terms from 2.69 to 4.62 dinars per kilogram. Consumption was affected less by the price than by the temporary shortage of this product, but also by the exceptionally favorable hydrological conditions in 1980, which made it possible to considerably reduce consumption of residual furnace oil in thermal electric power plants, a difference estimated at about 300,000-400,000 tons.

Last year there was also an increase in the consumption of natural gas over 1979 by about 700 million cubic meters, which could objectively replace 500,000-600,000 tons of residual fuel oil or other derivatives (or other fuels), so that this fact also contributed to the reduced consumption of heating oils in Yugoslavia.

Under these conditions the consumption of residual fuel oil dropped in 1980 to 6,293,000 tons from 6,862,000 tons, which was the figure recorded in 1979.

Less asphalt was also produced in 1980 than a year previously. The total was 638,000 tons, as against 785,000 tons in 1979, or a drop of 12 percent.

Motor oil sales were 111,000 tons, or a drop of 3 percent. The amount of motor oils relative to motor gasoline and diesel fuel has continued to drop and amounted to only 2.1 percent in 1980, which is close to the usual percentages (between 1.7 and 1.9 percent) of the advanced countries.

Industrial oils and greases had a consumption of 254,000 tons, or an increase of 3 percent. Jet fuel sales rose 8 percent from 345,000 tons to 351,000 tons, mainly because of increased domestic traffic. The unfavorable prices, as well as the shortage of this article, had a considerable impact on the consumption of foreign airlines.

Table 2. Imports of Derivatives in Yugoslavia

<u>Product</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>Index 80/79</u>	<u>Index 80/78</u>
In Thousands of Tons					
Gas oil	219	106	201	180	92
Heating oil	961	1,015	695	68	72
In Millions of Dinars					
Gas oil	504	532	1,779	334	353
Heating oil	1,478	2,474	3,530	143	239
Average Price in Dinars Per Kilogram					
Gas oil	2.30	5.02	8.85	176	384
Heating oil	1.53	2.44	5.08	208	332

Source: INDEKS, No 2, 1981, Federal Bureau of Statistics, Belgrade.

The shortage of liquefied gas on the domestic market was felt especially in the winter months of 1979 and 1980. Total sales were 392,000 tons, which is 5 percent less than a year before.

In 1980 the Yugoslav market consumed a total of 15,507,000 tons of derivatives as against 16,383,000 tons in 1979, or a drop of 5 percent.

There have been no essential changes in the pattern of consumption. Furnace oil had the highest share at 42.4 percent, which is slightly less than in 1979, when residual fuel oil had a share of 41.9 percent of consumption. The slackened supply of this article on the domestic market certainly contributed to that. This share is still above the yield of the Yugoslav refineries, where it has been about 32 percent in recent years. The difference was made up from imports, which amounted to about 700,000 tons (Table 2).

The share of gas oils remained at the same level of 29 percent, while the share of gasolines dropped from 15.2 percent to 14 percent.

Table 3. Sales of Petroleum Derivatives in Yugoslavia

In thousands of tons

Article	1977	1978	1979	1980	Index		Distribution	
					80/79	72/78	1980	1979
1. Primary gasoline	65	172	272	424	156	158	1.6	1.1
2. Aviation gasoline	17	16	18	18	100	114	0.1	0.1
3. Motor gasoline, 86 octane	519	588	572	506	88	92	3.4	3.8
4. Motor gasoline, 98 octane	<u>1,600</u>	<u>1,746</u>	<u>1,757</u>	<u>1,612</u>	<u>92</u>	<u>101</u>	<u>10.6</u>	<u>11.4</u>
Total motor gasolines (3 + 4)	2,119	2,334	2,329	2,118	91	100	14.0	15.2
5. Special gasoline and white spirits	77	69	70	64	91	102	0.4	0.5
6. Kerosene and jet fuel	259	318	345	351	102	108	2.1	2.1
7. Diesel fuel	2,532	2,693	3,005	2,949	98	111	18.0	17.6
8. Extralight and special	<u>1,384</u>	<u>1,777</u>	<u>1,797</u>	<u>1,695</u>	<u>94</u>	<u>101</u>	<u>10.8</u>	<u>11.6</u>
Total gas oils (7 + 8)	3,916	4,470	4,802	4,644	97	107	28.8	29.2
9. Furnace oil	5,982	6,391	6,862	6,293	92	107	42.4	41.7
Not including internal consumption (refineries)	4,713	5,746	6,373	5,785	--	--	--	--
10. Asphalt	551	643	785	638	81	122	4.7	4.2
11. Motor oils	108	109	114	111	97	103	0.7	0.7
12. Industrial oils	135	226	247	254	103	109	1.5	1.5
13. Industrial greases	8	9	10	10	100	110	0.1	0.1
14. Paraffins	6	9	10	11	110	110	0.1	0.1
15. Gas	361	414	413	392	95	100	2.5	2.7
16. Other	<u>106</u>	<u>144</u>	<u>107</u>	<u>179</u>	<u>167</u>	<u>74</u>	<u>1.0</u>	<u>0.9</u>
Grand total	13,710	15,324	16,383	15,507	95	107	/100/	/100/
Consumption as fuel	12,654	13,944	14,749	13,816	94	106	90.0	91.0
Consumption for other purposes	1,056	1,380	1,614	1,691	103	118	10.0	9.0

Source: Sales figures supplied by members of the business communities of Nafta of Zagreb and Petrolunion of Belgrade.

- Remarks to Table 3:
1. Includes internal consumption of the refinery and bunkering of ships and aircraft.
 2. Motor gasolines include 86-octane and 98-octane motor gasoline.
 3. The group "Gas oils," aside from diesel fuel, also includes extralight household heating oil and special industrial heating oil.
 4. "Furnace oil" includes light, intermediate and heavy furnace oil.
 5. "Other derivatives" include aromatics, petroleum coke, etc.

As for gasolines, we should mention that the share of regular is continuing to drop and amounted to only 24 percent in 1980. It is obvious that the Yugoslav market wants a gasoline with a higher octane number, and our refineries are already quite late in this regard.

The share of other products has mainly remained unchanged. On the Yugoslav market 13,846,000 tons of total consumption of petroleum derivatives went for energy consumption, nonenergy consumption was 1,691,000 tons, or 10 percent of total consumption, as against 9 percent a year earlier.

Natural gas consumption on the Yugoslav market was limited by domestic production, which in 1980 was 1,869 million cubic meters, and by imports amounting to 1,607 million cubic meters. In all, then, consumption was 3,476 million cubic meters, or 30 percent more than in 1979.

Table 4. Production and Imports of Natural Gas in Yugoslavia

In millions of cubic meters			
	<u>1979</u>	<u>1980</u>	<u>Index 80/79</u>
Production	1,910	1,869	98
Imports	<u>753</u>	<u>1,607</u>	<u>213</u>
Total	2,663	3,476	131
Inventories	--	16	--
Consumption	2,663	3,460	130

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CSO: 2800/344

SLOVENIAN ENTERPRISES TO PRODUCE COMPUTERS

Belgrade EKONOMSKA POLITIKA in Serbo-Croatian 17 Aug 81 p 14

[Text] Three Slovenian complex organizations of associated labor, Iskra, Gorenje and Elektrotehna, following several years of negotiations, have finally agreed to jointly develop the production of electronic computers. The announcement that agreement had been reached was made at the last meeting of the Executive Committee of the Slovenian Economic Chamber by Janez Kocijancic, director of Intereksport of Ljubljana, who has also been the chairman of the initiating committee for establishment of a joint organization for production of computers. The new organization whose founders will be the republic as a sociopolitical community and the three complex organizations we have mentioned, will operate under the auspices of the republic Executive Council and the Slovenian Economic Chamber. The initial capital and necessary personnel will be furnished by the founders. The new organization's development and business operation will be guided by a separate public body--its council.

The new work organization (which will not be divided into basic organizations of associated and will have collective business management) will take over the production programs which have been developed up to this point by the work organizations Delta, which is a part of Elektrotehna, and Elektromehanika of Kranj, which is a part of Iskra. Its main goal will be to organize and develop production of microcomputer systems. The founders have assumed the obligation, in collaboration with other interested organizations, to devise a joint program for development and production of a single electronic computer for business, processing, research and educational purposes.

The reaching of agreement was slow and painful in spite of the encouragement that came from republic bodies and agencies. One reason for this is certainly the relations which the domestic manufacturers have established with foreign partners. Iskra (under a license of CDC) and Delta have been manufacturing computers, while Gorenje has a contract on industrial cooperation with the American firm Burroughs, but has not yet begun the production of computers.

Delta is the leader in the volume of output (last year it produced some 50 computer systems worth about 700 million dinars) and faces a restriction on imports of manufacturing materials. In answer to the question of a delegate in the Assembly which was intoned like a protest Iztok Vinkler, chairman of the republic

committee for culture and science, was to answer that the purpose of restricting imports was not to block technological development, but with the necessary measure to provide guidance and to prevent uneconomical and socially irresponsible development in the production of computers.

The Executive Council of the Slovenian Assembly has emphasized several times that developing the production of computers and data processing equipment has strategic importance to the republic's long-range development and for that reason the interest of one particular organization of associated labor cannot be allowed to outweigh the common interest.

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CSO: 2800/341

MONTENEGRO'S FOREIGN INDEBTEDNESS REQUIRES NEW STEPS

Titograd POBJEDA in Serbo-Croatian 30 Aug 81 p 5

[Article by Branislav Radunovic]

[Text] At this point there are quite a few reasons why our republic's debts and indebtedness are being talked about in quite a different way and much more boldly than this was done 5 years ago or even less. First of all, the reader must know that our overall development up to this point has been based largely on capital investments, and that means on resources in the form of foreign credits, and to a lesser extent on growth of income and labor productivity. To be still more specific, for long years Montenegro has been among those regions of our country which have been spending most of their income to build new projects and for reconstruction of existing ones. That is why we have constantly been confronted with investment projects of considerable size for which funding has not been provided, and this is one of the essential causes of the slow activation of new factories, excessive cost overruns and the lengthy "tying up" of a considerable portion of the resources of society. At the same time, all those failings have been "covered" mainly with credits from abroad.

Thus Montenegro has come into a situation where today it has the highest level of foreign indebtedness of all the republics and provinces. That debt is twice as high as the national average, and the major portion of it, 61 percent, is in convertible currencies.

The largest users of foreign credits, and that means that they are also the largest debtors, have been the Aluminum Combine, the Boris Kidric Steel Mill, Jugooceania, the Electric Power Industry of Montenegro, the 13 Jul Agricultural Combine, the Pljevlja Thermal Electric Power Plant, the port of Bar, the Titograd Railroad Transportation Organization, and others. The Aluminum Combine and the Boris Kidric Steel Mill alone account for 40 percent of Montenegro's total debt. These two organizations will also have the highest payments to make up to 1985.

An Obligation Which Necessitates Radical Changes in Behavior

For all those reasons large tasks await the Montenegrin economy, especially the 20 or so work organizations which are its largest debtors, in the current 5-year

period with respect to economic cooperation with foreign countries. That is why it is necessary for all planning entities, and especially sociopolitical communities where those organizations of associated labor are located, to reassess as soon as possible the realism of the development plans adopted for the period up to 1985 and provide the money to reschedule obligations by reducing resources for new investment projects, thereby helping the process of reducing the economy's indebtedness.

Work organizations exporting goods and rendering services must in 1985 achieve an influx of 523 million dinars of foreign exchange, which is about 240 million more than achieved last year. This change of direction is indispensable in order to diminish the deficit in the balance of payments and to halt the growth of indebtedness. All computations show that it is possible to achieve this if exports cover at least 70 percent of imports. That, of course, is without petroleum, and the figure would be 53 percent when petroleum is included. (This "difference" alone puts a burden of about 190 billion dinars on the republic's payments-balance position in the form of goods imported this year!)

Nor can we get around the reminder that our republic has assumed an obligation to maintain its indebtedness at last year's level during this year and the next 4 years. This is undoubtedly a big job for the economy and a complex task for the entire society, one which requires many changes in operation and in behavior. Above all on the part of those agencies and organizations which are directly concerned with export and import policy.

Structure of the Economy Dictates a High Share of Imports

Montenegro cannot be satisfied with the results in international economic exchange achieved during the past planning period. For the simple reason that except for last year the coverage of imports by exports was only 40 percent. We had hoped that this initial year of the new planning period would bring certain encouragement in this respect, but this did not happen. On the contrary, the results of 7 months of visible trade with foreign countries show that the coverage of imports by exports has dropped to 21 percent in trade with the convertible area and that the deficit in visible trade has reached the amount of 3.87 billion dinars. Judging by certain signs and estimates, we can expect that this deficit will be corrected somewhat by the end of the year, but certainly not as much as the economy would like.

In seeking an answer to the question of whether Montenegro can free itself of this high dependence on imports, the point of departure is always that the growth of industrial output, whether we like it or not, depends largely on imports for the production process without which many industries would not be able to perform their planned tasks, much less surpass them. At this point we should also mention the importation of equipment from the convertible market, for which Montenegro allocated a huge amount of foreign exchange in the last planning period, but the situation has not changed for the better even this year. To illustrate, of the total value of imports during the first 7 months of this year (4,927 million dinars) 1,855 million dinars were set aside to purchase equipment. Nor, surely, will that be all, since the demands of work organizations to import

equipment in the current year are tenfold greater than the amounts which were recently approved by the Executive Council of Montenegro.

It is obvious, then, that the structure of a large portion of our economy, created by the investment policy conducted up to now, also dictates a large importation of equipment, manufacturing materials and raw materials. The simplest thing, but not the most expedient, would be to adopt certain restrictions. Reduction of imports of this kind would not be very helpful either to work organizations or to the economy in general. There are, however, quite a few opportunities for this to be done in other sectors. We are referring above all to greater and better organized use of our own economic potential, selection of products for export, orientation toward products that represent a higher degree of manufacturing and especially toward products which can come out of our own R&D program.

In addition, there is often no monitoring of the spending of foreign exchange, which is so scarce, for goods we do not absolutely need, particularly consumer goods. We are continuing to import quite a bit of food, which we could reduce, if not eliminate altogether, if more orderly relations prevailed on our market.

Society Is No Longer Able To Pay the Bills for Unprofitable Investment Projects

The new stabilization measures, which actually are not temporary in nature, orient all entities toward mandatory reduction of imports--through greater use of our own raw materials and through development of our own production and equipment, on the one hand, and by strengthening the orientation toward exports in industry on the other. This is the basic strategy in the plans for Montenegro's future development. That is also why it is being clearly pointed out in every segment of associated labor and in all sociopolitical communities that without an established export policy it is not possible to resolve the three important problems of reducing the deficit in visible trade, guaranteeing an adequate growth rate of industrial production and reducing foreign indebtedness.

In all these efforts one must not forget that now and in the future the "republic treasury" will be opened less and less frequently and that more and more often work organizations will have to reduce their business accounts and compare them with the law of value in its international dimension so that they can be more competitive on the foreign market in terms of their productivity and product quality. And something else: There will be fewer debts only when people understand and confirm in practice that society is no longer able to pay the bills for unprofitable investment and uneconomical economic performance.

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CSO: 2800/341

INITIAL ESTIMATES OF 1982 ELECTRIC POWER DEMAND

Belgrade EKONOMSKA POLITIKA in Serbo-Croatian 3 Aug 81 pp 14-15

[Text] The Executive Committee of the Community of the Yugoslav Electric Power Industry recently examined what is referred to as the preliminary electric power budget of Yugoslavia for 1982, that is, the first estimates of consumption and production of electric power, which is arrived at on the basis of the data furnished by the republics and provinces. The basic characteristic of this budget is that it foresees a shortage of about 4,300 gigawatt-hours of electric power. Plans have been made to generate about 67,000 Gwh next year, which is 6 percent higher than the plan for this year. However, a much larger jump has been anticipated in consumption. According to the estimates of the republics and provinces, about 71,300 Gwh of electric power would be consumed next year--12 percent more than this year. This occurred above all because a very high increase has been planned in the consumption of direct consumers (30 percent), though provision has not been made for a single major facility to go into operation. Looking back, over the past medium-term period electric power consumption increased at an average annual rate of 7.7 percent, and under this year's electric power budget, consumption was supposed to be 7.4 percent greater than last year.

One of the conclusions of the executive committee was that the republics and provinces have planned their consumption unrealistically and that it should be brought into more realistic limits in the coming period, during adjustment of the budget. According to the estimates of the load control service of the Yugoslav Electric Power Industry, it is most likely that consumption will be about 68,000 Gwh next year. But even with consumption at that level great difficulties are expected in supply during the winter periods of next year, especially in the first quarter.

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CSO: 2800/341

ECONOMIC EFFECTS OF BELGRADE--BAR RAILROAD ASSESSED

Belgrade TRANSPORT in Serbo-Croatian No 7, Jul 81 pp 19-21

[Text] It was 5 years ago that the first train made its ceremonial run along the line from Belgrade to Bar. This is an occasion to sum up the results and the problems and to indicate the prospects for development of a transportation system consisting of the railroad line with the port at Bar as one of its junctions, as well as to examine the overall economic effectiveness in the region which is taking economic advantage of the new route.

When this transverse route reached the Adriatic Sea, our country obtained one more window on the world, one which provides the shortest connection to the sea for about 45 percent of the area of the country and at the same time opens up a real opportunity for larger amounts of transit cargo to be routed through our country.

All countries in the world are trying to derive benefit from the natural resources which they have. Today we think of those resources in broader and broader terms. One aspect is using the shortest and cheapest routes for freight, and at present maritime routes are the cheapest. The Mediterranean, which as a practical matter connects the advanced countries of Europe with the developing countries of Africa, Asia and the rest of the world, is one of the vital transportation nexuses, one in which we are all directly involved in through our policy of self-management and nonalignment and by virtue of our geographical position and position in transportation. A comprehensive study needs to be made of advantages, potential and opportunities for development, the most economical investments should be chosen, and there should be persistence in implementing the transportation policy that is agreed on.

The commitment of our socialist self-managing community to carry out the construction of the transportation system we have been talking about has been succinctly summarized by Dr Mirko Dokic in the following observations concerning its benefits:

- i. reduction of operating costs in maritime transportation,
- ii. reduction of shipping charges for freight because the roundabout route has been shortened,

iii. savings in interest on working capital because goods spend less time en route, and

iv. national income is augmented in economic activities under the impact of the railroad's construction.

The new transportation system was unable to offer all the economic benefits immediately to economic activities for the well-known reasons that all the components in the system had to be synchronized and worked out. Viewed from the standpoint of the national economy a rail rate system is being shaped in transportation which by virtue of the level of shipping rates should facilitate the most favorable development of the process of expanded social reproduction. It is still necessary for a great deal of work in all areas to be made in our society so that rate policy keeps pace with developments in operation of the economy in interest of faster overall social development.

The effects in freight traffic on the Belgrade--Bar railroad and transshipment in the port of Bar will be illustrated with the year 1980 as an example, i.e., in terms of the benefits of lower shipping costs on the shorter route for only a portion of the total freight carried. Imports and exports of goods transshipped in the port of Bar and carried on the Belgrade--Bar line showed an upward trend in all the past 5 years, even in 1979 when the earthquake on the Montenegrin coast considerably diminished the capacity of the port's docks and installations. Traffic was as follows through the port of Bar in 1980, the year we have taken to illustrate the effects of the railroad:

General cargo	498,000 tons
Bulk cargo	<u>637,000 tons</u>
Total	1,135,000 tons

Most of the cargo was carried by rail, but part was carried by highway vehicles, which is an objective necessity and need manifested in all seaports. There is considerable dispersion of import and export cargo through Bar over a broad region of Yugoslavia. We will examine the economic benefits only for a part of the volume of cargo that was transshipped, that portion associated with Serbia proper, as follows:

General cargo	300,000 tons
Bulk cargo	<u>300,000 tons</u>
Total	600,000 tons

a) The following elements were chosen in working out the calculation of the shipping costs for 300,000 tons of general cargo, that is, the saving on shipping costs through Bar as compared to the other seaport which is nearest:

- i. the same port costs in comparative seaports,
- ii. the average shortening of the shipping route by 150 km,

iii. shipping charges computed at the railroad rate schedule in effect for 1980,

iv. the computation was made for a 20-ton shipment,

v. all freight was computed as second-class freight in the rate schedule, which for the given elements in the calculation amounts to 148 dinars per ton. In actuality a large portion of this freight was carried under the first rate class, but in selecting our adjusted averages we intentionally chose the unfavorable lower rate.

300,000 tons x 148 dinars per ton = 44.4 million dinars saved because of the shorter shipping rate.

b) Similar assumptions were taken for 300,000 tons of bulk cargo, that is, the actual shortening of the shipping route of cargo through Bar to the ultimate user as compared to the other seaport which is nearest:

i. the same port transshipment costs in the comparative ports,

ii. the average shortening of the shipping route by 100 km,

iii. shipping charges computed at the railroad rate schedule in effect for 1980,

iv. the computation was made for a 20-ton shipment,

v. all goods were computed in rate-schedule class 4, which is 94 dinars per ton.

300,000 tons x 94 dinars per ton = 28.2 million dinars saved in shipping costs.

The total saving is:

For 300,000 tons of general cargo	44,400,000 dinars
For 300,000 tons of bulk cargo	<u>28,200,000</u> dinars
Total	72,600,000 dinars

Cargo handling in the port has had an upward trend over the last 5 years:

In thousands of tons

	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>Cumulative Total</u>
General cargo	332	341	387	435	498	1,993
Bulk cargo	<u>460</u>	<u>474</u>	<u>553</u>	<u>702</u>	<u>637</u>	<u>2,826</u>
Total	792	815	940	1,137	1,135	4,819

This transverse route has provided enormous advantages in linking together the various regions of the country; it has made it possible to derive a proper benefit from the natural resources that exist and to facilitate uniform development within the framework of our self-managing community.

We have included in general cargo miscellaneous piece and packaged cargo: sacks, bales (jute, wool, cotton, raw cellulose, etc.), palletized cargo, finished and semifinished products of the manufacturing industry, products of ferrous and non-ferrous metallurgy, structural fabrications, industrial equipment, and the like.

We included in bulk cargo basic raw materials which are transshipped in the port, and these are iron ore, raw magnesite, concentrates and grain. In the year we have analyzed it was again true that a portion of the cargo was trucked from other seaports to the area served by the port of Bar, which was done at shipping costs that were twice or three times as high as the shipping charges by rail and in the knowledge that there is unused capacity available on the Belgrade--Bar railroad.

The regions of southwest Serbia, the Morava Valley, and eastern Serbia, with their economic potential, have tremendous economic advantages and savings in the shipping of goods if they ship their imported and exported goods, especially in economic cooperation with overseas countries, by the Belgrade--Bar railroad to the port of Bar.

These economic benefits necessitate that an organized, comprehensive and attentive approach be taken to establishment of self-management links and conclusion of self-management agreements concerning still more advanced and intensive use of the facilities which have been built, which is the largest contribution to the overall measures of stabilization of the economy, to the strengthening of income-sharing relations and to the development of a socialist society.

The economic benefits for SR [Socialist Republic] Montenegro from construction of the railroad line and seaport are twofold:

- i. firmer and economically more optimum linkage with the other republics within the SFRY, along with facilitation of better economic developments within the framework of the unified Yugoslav market, and
- ii. use of the shortest route in overseas imports and exports of approximately 500,000 tons of freight. By and large this traffic is already using facilities of the seaport and railroad line as a regular thing.

The benefits are also being manifested more and more in use of the railroad to carry freight from the broader area served by the port and for the shipment of transit freight. The growth of freight traffic, along with the favorable economic benefits, also acts in turn as a thrust for the growth of maritime shipping, which represents one of the important levers of development in our society's economic system.

The general characteristics of the overall constructive trend of growth in the shipping of freight on the Belgrade--Bar railroad and use of the port of Bar is the ever greater economic competitiveness of shippers and users of cargo-handling services on the international market, which is expressed in lower shipping costs of both raw materials and also finished products. Actually the economic benefits of the national infrastructure such as railroad lines and seaports afford their benefit in the income of the final users of that infrastructure.

In past years the problems have been characterized by objective difficulties which arose in using the entire system consisting of the railroad line and the seaport. In summary form they are as follows:

- i. when the rail line was built in Bar, appropriate freight stations and passenger stations were not built in good time. The absence of a switchyard in Bar is now being solved by building new tracks,
- ii. as the rail line was being built, faster work should have been done to work out the system of industrial sidings at work organizations immediately along the line,
- iii. the cars are old, the choice of specialized types of cars is small, and there is also a shortage of locomotives for traction,
- iv. certain terminals in the port were not built, and the need for them has been felt: the terminal for edible oils, the grain silo, which is only now being completed, and also the terminal for special cargo, and
- v. serious difficulties were especially pronounced on the rail line and in the port because of the earthquake which struck the Montenegrin coast on 15 April 1979, when nearly 70 percent of the infrastructure in the port was destroyed.

Subjective factors have been under the considerable influence of objective conditions in work organizations on the railroad and in the port and are mainly the same as those encountered by all work organizations which are part of the national infrastructure.

The overall problems are multiplied in their adverse impact when that infrastructure is under construction for a long number of years, especially if work organizations are burdened by high obligations resulting from credit, which is the case with the work organizations in rail transportation and with the seaport. The more refined equipment which is being used more and more in transportation, the new technological procedures and processes necessitate more diverse and specialized training of personnel and also a complete system of management and operation, along with strict respect for work discipline in performance of work tasks.

In spite of all the objective and subjective difficulties, this transportation system is more and more affording markedly favorable economic benefits in the transshipment and shipping of goods for the broader area which it serves.

We have intentionally not analyzed the benefits from transshipment and shipping of liquid cargoes for two reasons:

- i. the lasting orientation to import crude petroleum through the oil pipeline that has been built from the terminal on Krk to Pancevo for all the needs of domestic refining,
- ii. at present negligible amounts of other liquid cargoes are being transshipped in Bar to meet the needs of the Montenegrin economy.

The prospects for development of this transportation system are depending upon the measures which need to be taken for normal use of the facilities which have been built:

- i. rounding out equipment and the system of traction on the railroad,
- ii. reconstruction and synchronization of development of port installations, and
- iii. completion and affirmation of related activities.

Transportation policy within the framework of our self-managing community, which is being undertaken by its various public and economic entities, is an essential factor that determines the direction and extent of development of our transportation system.

One of the conditions for transportation's development is that an examination be made of mutual relations and homogeneity within economic development commitments and possibilities, i.e., examination of development of an integrated transport system which on the basis of present-day technical and technological advances would yield the most favorable benefits in the rendering of shipping services.

The designed capacity of the Belgrade--Bar railroad to carry domestic freight, imports and exports and transit freight amounts to more than 7 million tons of freight per year. Assuming transportation policy is carried out as it has been outlined, and that means modernization of rolling stock, updating shipping technology, improvement of organization of work and business operation, faster economic development will be possible for the regions the rail line passes through. Before the earthquake the port of Bar was equipped to handle about 4 million tons of cargo. Reconstruction and implementation of development plans should equip the port to handle more than 5 million tons of cargo, which opens up prospects for optimum transport of imports and exports and the offering of transit services.

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JAT RESULTS FOR THE FIRST FIVE MONTHS OF 1981

Belgrade TRANSPORT in Serbo-Croatian No 7, Jul 81 pp 39-40

[Text] According to operational data supplied by SPI [(?) Institute of the Transportation Industry], the aircraft of Jugoslovenski Aero+transport [JAT] carried a total of 1,297,130 passengers in the first months of this year, which is an increase of 12.1 percent over the same period of last year. If we compare them with the results for 1979, they are off somewhat, by 12.9 percent to be exact. This May alone a total of 359,923 passengers were carried, or 16 percent more than last May, but the figure is down 10.7 percent from May 1979.

Passenger traffic in this part of the year, according to the data supplied, is somewhat better than in the same period of last year. Nevertheless, it is still below the results which JAT recorded in 1979, which was its record year.

Viewed by types of traffic, the greatest jump has been made in long-route transportation. The increase was 37.3 percent over last year and even 23.5 percent over 1979.

Better Than Last Year on All Routes

In the 5 months a total of 1,212,070 passengers were carried in regular traffic, which is 12.4 percent more than last year. By comparison with 1979 this is a drop of 12.9 percent. In regular traffic 7,396.7 tons of cargo were carried, or 4.2 percent more than last year. If we compare this with 1979, the record year, cargo traffic has fallen off 5.6 percent.

In the breakdown by types of traffic, the result in long-route transportation is convincingly the best. The passenger volume was 40,479 passengers, which is all of 37.3 percent more than last year and 23.5 percent more than in 1979. In long-route transportation a very good result was also recorded in cargo transport. The volume of traffic was 1,801.7 tons of cargo, which is 71.1 percent more than in 1980 and all of 95.8 percent more than a year previous to that.

On domestic routes 839,167 passengers were carried in this part of the year, which is 12.7 percent more than in 1980. However, we are still below the results achieved in 1979 in the volume of passenger traffic in domestic transportation, all of 14.4 percent. Cargo traffic was 3,608.3 tons of cargo. Here

there was a dropoff from the same period of last year, a drop of 10.5 percent. If we compare this result to 1979, we find that the drop was still greater at 16.8 percent.

In European and Mediterranean traffic JAT aircraft carried 332,436 passengers, which is 9.2 percent more than last year. Traffic was down 12.3 percent from 1979. Over that same period 1,986.8 tons of cargo were carried, which is 1.3 percent less than in 1980 and 22.9 percent less than in 1979.

The passenger volume in charter traffic was 85,060, which is 8.5 percent more than in the same period of last year. Nevertheless, the number of passengers carried on charter flights was 11.7 percent less than in 1979. At the same time 157.5 tons of cargo were carried, which is 242.8 percent more than last year and 37 percent more than in 1979.

A Growth in the Passenger Volume in Domestic Traffic During May

A total of 326,513 passengers were carried in regular traffic in May, which is 18.8 percent more than last May. Compared to the same months of 1979, the passenger volume was down 11.4 percent. In that same month, 1,540.3 tons of cargo were carried in regular traffic, which is an increase of 5.4 percent over 1980. Cargo traffic was 11.4 percent less than in 1979.

In May of this year long-route transportation once again recorded very good results. The passenger volume was 10,182, or 61.9 percent more than in May 1980. The result is also improved over 1979 by all of 9.1 percent. At the same time 400.5 tons of cargo were carried, which is 60.7 percent more than last May and 130.2 percent more than in May 1979.

In domestic traffic 225,560 passengers were carried, or 18.9 percent more than in May 1980. The passenger volume was down 12.5 percent from May 1979. At the same time, 773.6 tons of cargo were carried, which is 0.5 percent more than last May or 26.2 percent less than in May 1979.

In European and Mediterranean transportation 90,771 passengers were carried, which is 15.3 percent more than last year. However, even in European and Mediterranean transportation the passenger volume was below the 1979 figure, the volume of passenger traffic in May was down 10.2 percent from that figure. The volume of cargo carried in May was 366.3 tons, which is 17.1 percent less than in May of last year and 29.1 percent less than in May 1979.

The passenger volume in charter traffic this May was 33,410. The result in charter traffic was down 5.5 percent from May 1980 and 3.9 percent from May 1979. The volume of cargo was 12.7 tons. This is 14.7 percent less than in 1980 and 75.5 percent less than in May of the year previous to that.

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